

NEW SPECIES OF *ANTHONOMUS* GERMAR IN THE *A. DOGMA* AND
A. FURCATUS SPECIES GROUPS (COLEOPTERA: CURCULIONIDAE)

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Abstract.—Four previously undescribed species of Neotropical Anthonomini are assigned to the *Anthonomus dogma* group. These are *A. dogma* (Colombia, Panama), *A. idea* (Brazil), *A. opinionis* (Panama, Venezuela) and *A. ratio* (Brazil). Characters of the *A. dogma* group and of each of the species in the group are described and a key to the species is presented. The habitus of each species, the pygidium, abdomen, femur and tibia of some of the species, and the male genitalia of one of the species are illustrated with photographs. A new species of the *Anthonomus furcatus* group, *A. blik* (Venezuela), is also described and illustrated.

Key Words: Coleoptera, Curculionoidea, Curculionidae, *Anthonomus dogma*, *Anthonomus idea*, *Anthonomus opinionis*, *Anthonomus ratio*, *Anthonomus blik*

A recently recognized new species of *Anthonomus* in the *A. furcatus* group differs somewhat in external appearance from the eleven species previously assigned to that group (Clark 1988a). The type of this species bears impressive resemblance to specimens representing four previously undescribed species that belong to a group related to the *A. furcatus* group. This group is described herein as the *A. dogma* species group. This paper includes descriptions and illustrations and a key to the species in the *A. dogma* group, as well as a description and illustrations of the new species in the *A. furcatus* group.

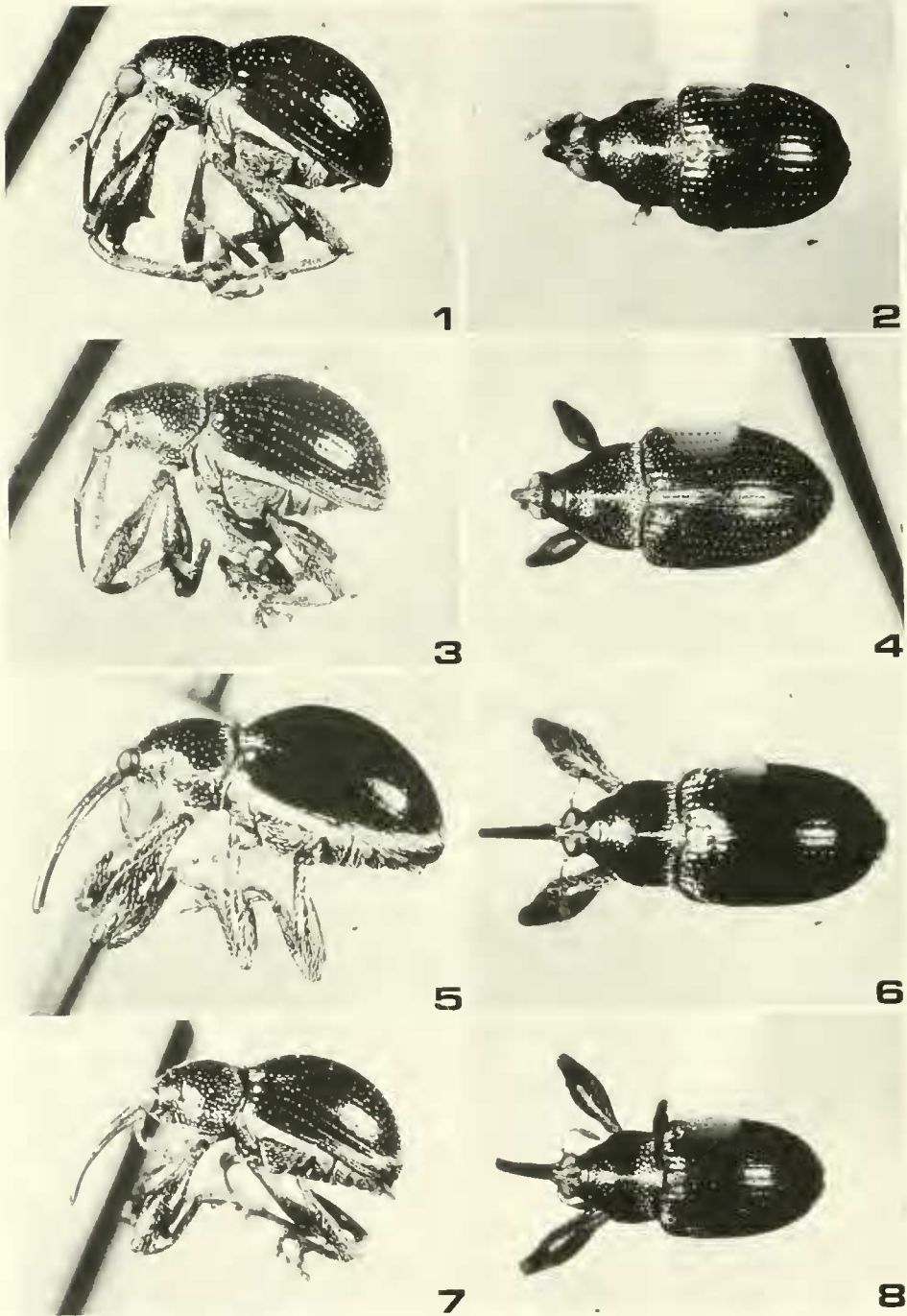
MATERIALS AND METHODS

Specimens of 11 adult weevils were examined. These are from the collections of the following individuals and institutions (letter codens identify the collections in the text): Collection of C. Bordón, Maracay, Venezuela (CCBM); Collection of C. W. O'Brien, Tallahassee, Florida, USA

(CWOB); Collection of H. P. Stockwell, Smithsonian Tropical Research Institute, Panama (HPSC); Universidad Central de Venezuela, Maracay, Venezuela (IZAV); Museu Paraense Emilio Goeldi, Belém, Brazil (MPEG); Museu de Zoologia, Universidade de São Paulo, São Paulo, Brazil (MZSP); Texas A&M University, College Station, Texas, USA (TAMU); National Museum of Natural History, Washington, D.C., USA (USNM). Measurements were made according to criteria described by Clark (1994). Exact label data are cited for types. Separate labels are indicated by brackets ([]), each separate line by a slash (/).

THE *ANTHONOMUS DOGMA* GROUP

Recognition characters.—The members of the *A. dogma* group are moderately large, shining, black *Anthonomus* (length = 2.88–3.60 mm; width = 1.32–1.76 mm) with sparse lacteous scales above, and broader, dense lacteous scales beneath (Figs. 1–8).



Figs. 1-8. *Anthonomus dogma* group members, habitus, lateral and dorsal views. 1, 2) *A. dogma*, female, Fort Clayton, Panama, Panama; 3, 4) *A. idea*, female, holotype; 5, 6) *A. opinionis*, female, holotype; 7, 8) *A. ratio*, female, holotype.

The pronotum and elytra are mostly glabrous, with lacteous scales in a narrow dorsal midline on the pronotum, along the posterior margin of the pronotum (Figs. 2, 4, 6, 8), in a conspicuous postocular vitta on the pleuron, and in an apicolateral elytral vitta (Figs. 1, 3, 5, 7) (the latter feature is inconspicuous in *A. dogma* itself (Fig. 1)). The thoracic and abdominal sterna have dense lacteous scales. Similar scales are especially dense on the metepimeron and metepisternum and form a conspicuous line that connects the pleural and apicolateral elytral vittae (Figs. 1, 3, 5, 7). Each of the small to moderately large punctures on the remainder of the pronotum and on the upper portion of the pleuron has a minute, inconspicuous, aeneous seta. The profemora are moderately to strongly inflated, 1.4–1.9× as wide as the metafemur.

Relationships.—The most striking attributes of the species in the *A. dogma* group are the smooth, shining, black integument and the contrasting sparse lacteous scales of the convex pronotum and elytra (Figs. 1–8). Some unrelated species of *Anthonomus* with similar characteristics were assigned to the *A. albolineatus* group by Clark (1987). These had been described by Champion (1903) as having “. . . general facies like that of *Otidocephalus*” and by Sleeper (1958) as “superficially” resembling otidocephaline Curculionidae. They were inelegantly designated “otidocephaline-like” by Clark (1987), who asserted that the peculiar condition “. . . is the result of convergent evolution in Otidocephalinae and Anthonominae [and] . . . in different groups of Anthonominae.” Convergence was also invoked when anthonomines with similar features turned up in the genus *Loncophorus* Germar (Clark 1988b).

The somewhat “otidocephaline-like” species in the *A. dogma* group appear not to be closely related to the anthonomines in these other groups. They seem instead to be allied to “non-otidocephaline-like” species in the *A. subulatus* and *A. furcatus*

groups. The rostrum of *A. subulatus* (Champion) is “abruptly and strongly narrowed at the antennal insertions, . . . the distal portion . . . extraordinarily narrow, smooth, glabrous, and subparallel sided in dorsal view” (Clark 1993). The rostrum is similar in two of the species in the *A. dogma* group, *A. dogma* and *A. idea* (Figs. 1, 3). The endophallus of some of the species in the *A. furcatus* group is like that in *A. subulatus* which has “two proximal . . . spines and one . . . more distal sclerite” (Clark 1993). The endophallus of *A. dogma* (Fig. 18) (males of the other species are unknown) is similar, but more like that of other members of the *A. furcatus* group, including the new species described herein (Fig. 19), in having an extra pair of spines between the proximal spines and the distal sclerite.

Plant associations.—Unknown.

Distribution.—The species of the *A. dogma* group are known from Brazil, Colombia, Panama and Venezuela.

KEY TO SPECIES IN THE
ANTHONOMUS DOGMA GROUP

1. Rostrum stout basally, strongly, evenly tapered to narrow apex in male, abruptly narrowed slightly beyond antennal insertions in female (Figs. 1, 3); elytra without humeral patch of dense lacteous scales (Figs. 2, 4); eyes strongly, evenly convex, not prominent (Figs. 1–4); abdominal sternum 5 of female with posteromedian clasp that apparently receives apical portion of pygidium (Figs. 13, 14); pygidium of female with slight apicomedian projection (Figs. 9, 10); metafemur with an obsolescent tooth distal to large ventral tooth (Fig. 15) 2
- 1'. Rostrum slender from base to apex (Figs. 5, 7); elytra with humeral patch of dense lacteous scales (Figs. 6, 8); eyes most strongly convex posteriorly, slightly prominent (Figs. 5–8); abdominal sternum 5 of female without posteromedian clasp; pygidium of female without apicomedian projection (Figs. 11, 12); metafemur without obsolescent tooth distal to large ventral tooth (Figs. 16, 17) 3
2. Elytra with dense lacteous scales on basal portions of sutural interstriae (Fig. 4); apicolateral elytral scales distinct, lacteous (Fig. 3); protibia of female without preapical tooth; metafemoral tooth conical *A. idea*

- 2'. Elytra without lacteous scales on basal portions of sutural interstriae (Fig. 2); apicolateral elytral scales indistinct, aeneous and lacteous (Fig. 1); protibia of female with preapical tooth; metafemoral tooth slightly uncinuate (Fig. 15)
..... *A. dogma*
- 3. Rostrum tapered distally (Fig. 7); metafemur with a short, conical ventral tooth (Fig. 17)
..... *A. ratio*
- 3'. Rostrum not tapered distally (Fig. 5); metafemur with a long, slender ventral tooth (Fig. 16)
..... *A. opinioms*

***Anthonomus dogma*, NEW SPECIES**

Figs. 1, 2, 9, 13, 15, 18

Holotype.—PANAMA. *Panama*: ♂ [Panama: Canal Zone/ Albrook Forest Site/ Fort Clayton] [Lot No. 174/ Feb. 23/24, 1968/ R. Hutton/ Black light trap] [University/ Arkansas/ Collection] (CWOB).

Paratypes (4).—COLOMBIA. *Norte de Santander*: 1 female [Colombia/ Norte de Santander/ 4 Km NW Malpaso/ 8 July 1982/ Clark & Cave] (TAMU). PANAMA. *Panama*: 1 female [Panama: Canal Zone/ Albrook Forest Site/ Fort Clayton] [Lot No. 174/ Feb. 23/24, 1968/ R. Hutton/ Black light trap] [University/ Arkansas/ Collection] (CWOB); 1 male [Panama: Canal Zone/ Albrook Forest Site/ Fort Clayton] [Lot No. 176/ Feb. 29/Mar. 12, 1968/ R. Hutton/ Black light trap] [University/ Arkansas/ Collection] (CWOB); 1 female [Panama: Canal Zone/ Albrook Forest Site/ Fort Clayton] [Lot No. 130/ Sept. 7/8, 1967/ Hutton & Llaurado/ Black light trap] [University/ Arkansas/ Collection] (CWOB).

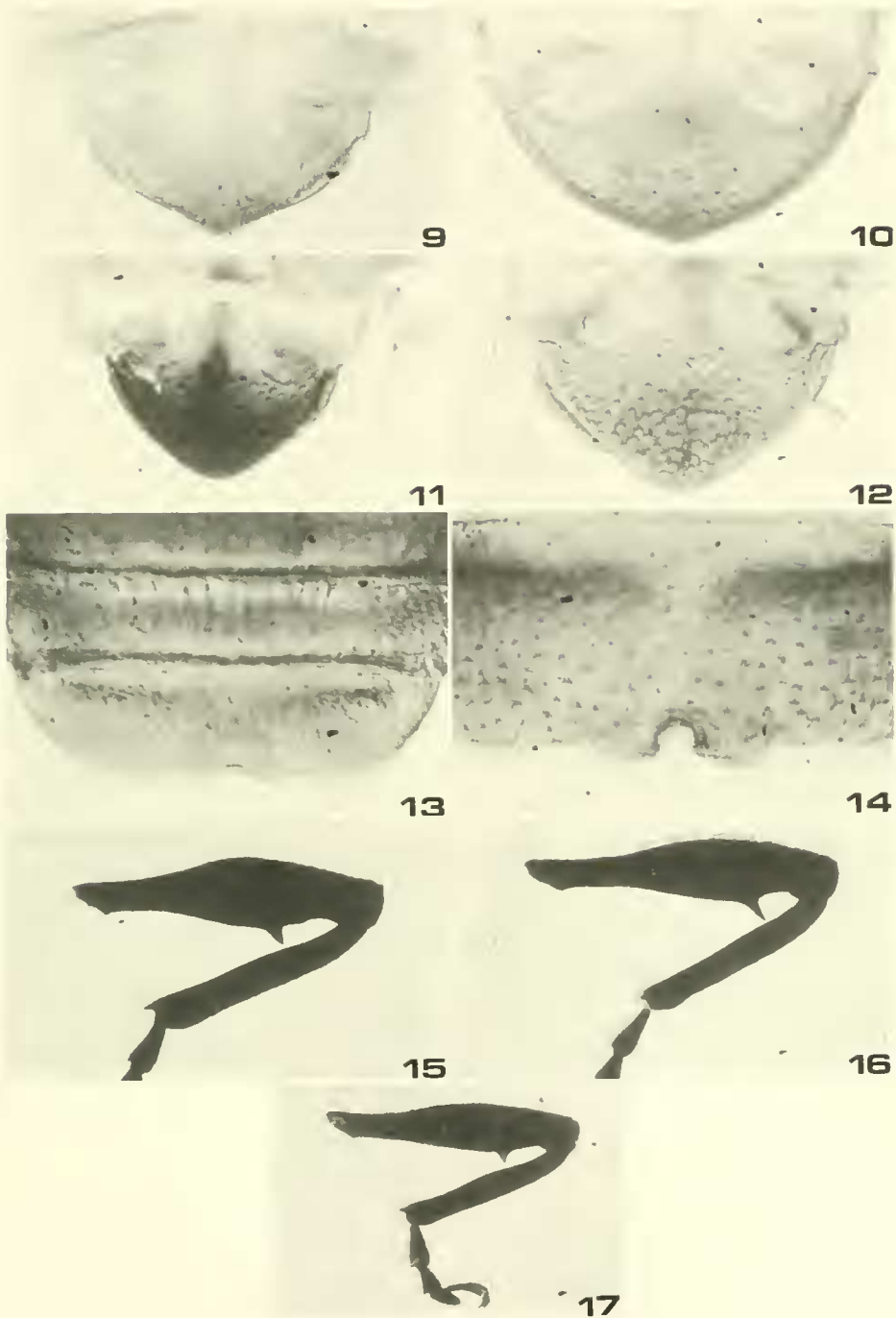
Recognition characters (Figs. 1, 2).—Rostrum stout basally, strongly, evenly tapered to narrow apex in male, abruptly narrowed slightly beyond antennal insertions in female (Fig. 1); elytra without lacteous scales on sutural interstriae (Fig. 2); apicolateral elytral scales minute, inconspicuous, aeneous and lacteous (Fig. 1); abdominal sternum 5 of female with posteromedian clasp that apparently receives apical portion of pygidium (Fig. 13); median emargination of clasp broad (Fig. 13); pygidium of female with rounded apicomedian projection (Fig.

9); eyes strongly, evenly convex, not prominent (Figs. 1, 2); protibia of female with a small, acute, preapical ventral tooth; metafemur with a slightly uncinuate, acute, ventral tooth and an obsolescent more distal tooth (Fig. 15); profemur ca. 1.4 × as wide as metafemur.

Male.—*Length*: 3.28–3.40 mm (n = 2). *Width*: 1.72–1.76 mm (n = 2). *Head*: eyes separated by distance ca. 0.8 × width of rostrum at base. *Rostrum*: length 1.26–1.59 × (n = 2) pronotal length; proximal portion carinate, sparsely setose, with narrow lacteous scales at extreme base and on frons; distal portion glabrous, sparsely punctate, length 46–48% (n = 2) of total rostral length. *Prothorax*: pronotum punctate, interspaces broad, smooth, shining; pleuron more coarsely punctate, interspaces narrower, rugulose; pronotum with narrow midline of small, dense, lacteous scales, and with longer, sparser, lacteous scales along posterior margin; each puncture on remainder of dorsum and upper portion of pleuron with a minute, inconspicuous seta; pleuron with conspicuous postocular vitta of broad lacteous scales. *Elytra*: striae not impressed, with elongate punctures; interstriae slightly convex, smooth, shining, glabrous, except for apicolateral scales. *Abdomen*: sterna with lacteous scales that are broader laterally. *Legs*: coxae with dense, broad, lacteous scales; protibia slightly curved in basal 1/2, with slight inner marginal prominence in distal 1/3; protibial uncus short, slender, curved, acute; metatibial mucro stout, parallel to long axis of tibia. *Genitalia* (Fig. 18): aedeagus narrow, strongly sclerotized below, subtruncate apically; endophallus with two small basal spines, two similar, median spines, and a small distal spine.

Female.—*Length*: 2.88–3.28 mm (mean = 3.09, n = 3). *Width*: 1.42–1.72 mm (mean = 1.58, n = 3). *Rostrum*: length 1.49–1.60 × (mean = 1.54, n = 3) pronotal length; length of distal portion 46–49% (mean = 47, n = 3) of total rostral length.

Distribution.—*Anthonomus dogma* is



Figs. 9-17. *Anthonomus dogma* group members. 9-12. Pygidium, female, dorsal views: 9) *A. dogma*, Fort Clayton, Panama, Panama; 10) *A. idea*, holotype; 11) *A. opinionis*, holotype; 12) *A. ratio*, holotype. 13, 14. Abdomen, female, ventral views: 13) *A. dogma*, Fort Clayton, Panama, Panama; 14) *A. idea*, holotype. 15-17. Metathoracic legs: 15) *A. dogma*, Fort Clayton, Panama, Panama; 16) *A. opinionis*, holotype; 17) *A. ratio*, holotype.

known only from the type series from Colombia and Panama.

Anthonomus idea, NEW SPECIES

Figs. 3, 4, 10, 14

Holotype.—BRAZIL. *Pará*: ♀ [Sta. Isabel do Pará/ PA, Brasil/ 30.III.1962/ J. Bechyné col.] (MZSP).

Paratype (1).—BRAZIL. *Pará*: 1 female [BRAZIL Para/ Belem/ I-26-1969 L &/ C. W. O'Brien (CWOB)].

Recognition characters (Figs. 3, 4).—*Anthonomus idea* is similar to *A. dogma* from which it differs in the following characters: Elytra with dense lacteous scales on basal portions of sutural interstriae (Fig. 4); apicolateral clytral scales distinct, lacteous (Fig. 3); protibia of female without preapical tooth; metafemoral tooth conical, acute; median emargination of posteromedian clasp of abdominal sternum 5 of female deep, narrow (Fig. 14); pygidium of female with smaller apicomedian projection (Fig. 10).

Male.—Unknown.

Female.—*Length*: 3.12–3.24 mm ($n = 2$). *Width*: 1.50–1.58 mm ($n = 2$). *Head*: eyes round, strongly, evenly convex, not prominent, separated by distance ca. $0.8 \times$ width of rostrum at base. *Rostrum*: length 1.43–1.70 \times ($n = 2$) pronotal length; proximal portion carinate, sparsely setose, with narrow lacteous scales at extreme base and on frons; distal portion glabrous, length 56–58% ($n = 2$) of total rostral length. *Prothorax*: pronotum punctate, interspaces broad, smooth, shining; pleuron more coarsely punctate, interspaces narrower, rugulose; pronotum with narrow midline of small, dense, lacteous scales, and with longer, sparser, lacteous scales along posterior margin; each puncture on remainder of dorsum and upper portion of pleuron with a minute, inconspicuous seta; pleuron with conspicuous postocular vitta of broad lacteous scales. *Elytra*: striae not impressed, with elongate punctures; interstriae slightly convex, smooth, shining, glabrous, except for

scales on sutural interstriae and apicolateral scales. *Abdomen*: sterna with lacteous scales that are broader laterally. *Legs*: coxae with dense, broad, lacteous scales; protibia slightly curved in basal $\frac{1}{2}$, with slight inner marginal prominence in distal $\frac{1}{3}$; protibial uncus short, slender, curved, acute; metatibial mucro stout, parallel to long axis of tibia.

Distribution.—*Anthonomus idea* is known only from the type series from Brazil.

Anthonomus opinionis, NEW SPECIES

Figs. 5, 6, 11, 16

Holotype.—PANAMA. Panama: ♀ [PANAMA: C.Z./ 5 mi. NW Gamboa/ 12 July '76 Lubin] [Malathion/ canopy fog] [Antho./ #17] (from HPSC, deposited in USNM).

Paratype (1).—VENEZUELA. *Táchira*: 1 female [Sn. Joaquin/ de Navay/ Venezuela - Tachi-/ ra. 400 m./ 21-22-1979] [col./ A. Chacon] (IZAV).

Recognition characters (Figs. 5, 6).—*Anthonomus opinionis* is distinguished by the following combination of characters: rostrum slender, evenly, broadly curved, not tapered distally (Fig. 5); elytra with humeral patch of dense lacteous scales (Fig. 6); apicolateral clytral scales distinct, lacteous (Fig. 5); eyes most strongly convex posteriorly, slightly prominent (Figs. 5, 6); metafemur with a long, slender ventral tooth, without more distal tooth (Fig. 16); abdominal sternum 5 of female with posterior margin slightly produced; profemur ca. $1.9 \times$ as wide as metafemur.

Male.—Unknown.

Female.—*Length*: 3.44–3.60 mm ($n = 2$). *Width*: 1.52–1.58 mm ($n = 2$). *Head*: eyes separated by distance ca. $0.4 \times$ width of rostrum at base. *Rostrum*: length 1.70–1.93 \times ($n = 2$) pronotal length; proximal portion feebly carinate, apparently glabrous; distal portion smooth, glabrous, length 39–46% ($n = 2$) of total rostral length. *Prothorax*: pronotum sparsely, minutely punctate, inter-

spaces broad, smooth, shining; pleuron more coarsely punctate, interspaces narrower, rugulose; pronotum with narrow midline of small, dense, lacteous scales, and with longer, sparser, lacteous scales along posterior margin; each puncture on remainder of dorsum and upper portion of pleuron with a minute, inconspicuous seta; pleuron with conspicuous postocular vitta of broad lacteous scales. *Elytra*: striae not impressed, with minute punctures; interstriae slightly convex, smooth, shining, glabrous, except for scales on humeri and apicolateral scales. *Pygidium*: broad, without apicomedian projection (Fig. 11). *Abdomen*: sterna with lacteous scales that are broader laterally. *Legs*: coxae with dense, broad, lacteous scales; protibia curved in basal $\frac{1}{2}$, with inner marginal prominence in distal $\frac{1}{3}$, without preapical tooth; protibial uncus slender, slightly curved, acute; metatibial mucro obsolete.

Distribution.—*Anthonomus opinionis* is known only from the type series from Panama and Venezuela.

Anthonomus ratio, NEW SPECIES

Figs. 7, 8, 12, 17

Holotype.—BRAZIL. *Pará*: ♀ [Marituba/23.6.1961] [Brasil, PA/ J. & B. Bechyné] (MPEG).

Recognition characters (Figs. 7, 8).—*Anthonomus ratio* is similar to *A. opinionis* from which it differs in the following characters: Rostrum tapered distally (Fig. 7); metafemur with a short, conical ventral tooth (Fig. 17).

Male.—Unknown.

Female.—*Length*: 2.96 mm ($n = 1$). *Width*: 1.32 mm ($n = 1$). *Head*: eyes separated by distance ca. $0.4 \times$ width of rostrum at base. *Rostrum*: length $1.65 \times$ ($n = 1$) pronotal length; proximal portion feebly carinate, apparently glabrous; distal portion smooth, glabrous, length 45% ($n = 1$) of total rostral length. *Prothorax*: pronotum sparsely, minutely punctate, interspaces broad, smooth, shining; pleuron more

coarsely punctate, interspaces narrower, rugulose; pronotum with narrow midline of small, dense, lacteous scales, and with longer, sparser, lacteous scales along posterior margin; each puncture on remainder of dorsum and upper portion of pleuron with a minute, inconspicuous seta; pleuron with conspicuous postocular vitta of broad lacteous scales. *Elytra*: striae not impressed, with minute punctures; interstriae slightly convex, smooth, shining, glabrous, except for scales on humeri and in apicolateral vitta. *Pygidium*: broad, without apicomedian projection (Fig. 12). *Abdomen*: sterna with lacteous scales that are broader laterally. *Legs*: coxae with dense, broad, lacteous scales; protibia curved in basal $\frac{1}{2}$, with inner marginal prominence in distal $\frac{1}{3}$, with small, acute, preapical tooth; protibial uncus slender, slightly curved, acute; metatibial mucro obsolete.

Distribution.—*Anthonomus ratio* is known only from the type series from Brazil.

THE *ANTHONOMUS FURCATUS* GROUP

Recognition characters.—The species of *Anthonomus* in the *A. furcatus* group were characterized by Clark (1988a) as “relatively large anthonomines . . . with the rostrum relatively slender and of moderate length, the antennal funiculus 7-articulate and relatively large, and the eyes strongly and evenly convex.” Cited as unique characters of the group were the “aedeagus with distinct apicolateral prominences,” and “endophallus with two proximal endophallic spines and one straight or uncinuate, more distal sclerite,” most species also with “two spines between the proximal spines and the distal endophallic sclerite.” Additional characters cited, these shared with species in other groups, included “abdominal sternum 5 of male apicomediaally depressed and with a posteromedian prominence which is part of an isolated posteromedian sclerite . . . and profemora swollen, with a large ventral tooth and a smaller distal tooth.”



18



19

Figs. 18–19. *Anthonomus* species. 18, *A. dogma*, holotype, male genitalia, dorsal view. 19, *A. blik*, holotype, male genitalia, dorsal view.

The new species described below has all of these *A. furcatus* group characters. Nevertheless, it is quite distinct in appearance from the species previously assigned to the group and was overlooked until now, mainly because the vestiture is so different. In the previously described species, the scales on the pronotum and elytra are fairly dense, relatively broad, those on the elytral interstriae "short, narrow, the apices directed toward the midline of the interstria" (Clark 1988a:360). By contrast, the scales on the pronotum and elytra of the new species are small and sparse and the shining, black integument is broadly exposed between them.

Anthonomus blik, NEW SPECIES

Fig. 19

Holotype.—VENEZUELA. *Lara*: ♂ [VENEZ. Bordón/ leg. 13 XII 1978] [alred. de Bobare./ m. 900. Edo. Lara] (CCBM).

Recognition characters.—*Anthonomus blik* is distinguished from the other members of the *A. furcatus* group by the black, smooth, shining integument and the small, sparse, lacteous scales on the prothorax and elytra. The scales are dense only in a narrow median vitta on the pronotum and in a broad vitta that extends across the pleuron, across the metepimeron and metepisternum, and around the apicolateral portions of the elytra. This pattern gives the species the general "otidocephaline-like" appearance noted in the species in the *A. dogma* group. The large procoxal tooth is also unique to the species.

Male.—*Length*: 3.28 mm ($n = 1$). *Width*: 1.48 mm ($n = 1$). *Head*: eyes round, strongly, evenly convex, prominent, separated by distance ca. $0.5 \times$ width of rostrum at base. *Rostrum*: slender, length $1.52 \times$ ($n = 1$) pronotal length; proximal portion carinate, sparsely setose, with narrow lacteous scales at extreme base and on frons; distal portion glabrous, sparsely punctate, length 33% ($n = 1$) of total rostral length. *Prothorax*: pronotum punctate, interspaces smooth, shining; pleuron more coarsely punctate, interspaces narrower, rugulose; pronotum with narrow midline of small, dense, lacteous scales, and with intermixed sparse, long, narrow, lacteous scales and narrower, inconspicuous aeneous scales; pleuron with conspicuous postocular vitta of broad lacteous scales. *Elytra*: striae not to only slightly impressed, with elongate punctures; interstriae nearly flat, smooth, shining, with sparse, narrow, lacteous scales; lacteous scales broader and dense in long apicolateral vitta; interstriae 2–5 slightly prominent near base. *Abdomen*: sternum 5 with isolated posteromedian sclerite. *Legs*: procoxa with large, blunt, anterior tooth; profemur $1.8 \times$ as wide as metafemur, with a small slightly curved tooth anterobasal to large, broad-based, ventral tooth; protibia curved in basal $\frac{2}{3}$, with slight inner marginal prominence in distal $\frac{1}{3}$; protibial uncus slender, curved, acute; metafemur with one stout, conical tooth; metatibial mucro stout, parallel to long axis of tibia. *Genitalia* (Fig. 19): aedeagus with acute, apicolateral promi-

nences; endophallus with two basal sclerites amid a dense field of denticles, two median spines anterior to a median row of small, sparse denticles, and one stout distal spine.

Female.—Unknown.

Distribution.—*Anthonomus blik* is known only from the holotype from Venezuela.

Etymology.—The name of this species is a term applied by Rolston (1987) for any presupposition that might insulate a theory from refutation.

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LITERATURE CITED

- Champion, G. C. 1903. Insecta. Coleoptera. Rhynchophora. Curculionidae. Curculionoidea. Curculioninae (part), vol. 4, pt. 4, pp. 145–312. In Godman, F. D., and O. Salvin, eds., 1879–1911. *Biologia Centrali-Americana, Insecta, Coleoptera*, 7 volumes in 17 parts. London, Dulau.
- Clark, W. E. 1987. The species of *Anthonomus* in the *albolineatus* group (Coleoptera: Curculionidae). *Transactions of the American Entomological Society* 113(4): 309–359.
- . 1988a. Revision of the *furcatus* species group of the weevil genus *Anthonomus* Germar (Coleoptera: Curculionidae). *The Coleopterists Bulletin* 42(4): 359–377.
- . 1988b. Revision of the weevil genus *Lonchophorus* Chevrolat (Coleoptera: Curculionidae, Anthonominae). *Quaestiones Entomologicae* 24(3): 465–518.
- . 1993. *Listrorrhynchus* Champion, a new synonym of *Anthonomus* Germar (Coleoptera: Curculionidae). *The Coleopterists Bulletin* 47(2): 192–194.
- . 1994. The *Anthonomus gibbicrus* species group (Coleoptera: Curculionidae). *Proceedings of the Entomological Society of Washington* 96(2): 193–198.
- Rolston, H., III. 1987. *Science and Religion: A Critical Survey*. Temple University Press, Philadelphia. 357 pp.
- Sleeper, E. L. 1958. Notes on the Anthonominae (Coleoptera, Curculionidae). *The Ohio Journal of Science* 58(6): 366–370.